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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,152	06/22/2004	John G. Macke JR.	03-1139	4151

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EXAMINER	
EWALD, MARIA VERONICA	
ART UNIT	PAPER NUMBER
1791	

NOTIFICATION DATE	DELIVERY MODE
10/31/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/710,152	MACKE ET AL.	
	Examiner	Art Unit	
	MARIA VERONICA D. EWALD	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 June 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 18-22* is/are pending in the application.

4a) Of the above claim(s) *18-22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections – 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 – 6 and 9 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heugel (WO 2004/014636 A1) in view of Manuel, et al. (U.S. 6,587,742). It is noted that the Examiner is citing Heugel (U.S. 2005/0263932 A1) as the English-language equivalent of the above PCT publication.

Heugel teaches a sintering system comprising: a tool chamber enclosing a sinter material (items 11 and 12 – figure 1); a laser system sintering said sinter material as a function of controller signals (item 21 – figure 1) wherein a controller generates signals to control the sintering and fabrication of multiple three-dimensional objects (paragraphs 0013 – 0014).

Heugel is teaching a selective laser sintering (SLS) apparatus, in which three-dimensional parts are fabricated concurrently in build chambers which may be separate chambers or one single vat separated by a partition (paragraph 0013). The three-dimensional objects, (like other rapid-prototyping apparatus) are modeled via computer-aided design (CAD). The object is then partitioned into distinct layers. A layer of powder

is deposited onto the build platform and sintered via the laser system according to the cross-section of the object (paragraph 0003; paragraphs 0025 – 0026).

Heugel, however, does not teach that the specific controller used generates controller signals as a function of a predetermined tool design, said predetermined tool design comprising a first section of said tool comprising a joint component for coupling said first section to at least one other section of said tool. Thus, Heugel fails to teach that the parts fabricated in each chamber are a function of one tool design, such that the parts are to be matched and subsequently joined to build the tool design generated by the controller. Heugel also fails to teach the elements of the tool sections such that the first section is sintered separately from the second section, wherein the tool design comprises joint components on both sections, wherein the tool sections' joint components define holes, tongue features or contour details which allow the individual sections to be combined subsequent to sintering.

In an apparatus to fabricate a three-dimensional tool, Manuel, et al. teach the use of a laser cutting device and a controller. To fabricate large tools, previous prior art apparatus were comprised of laser cutting or grinding of one large block of material. Large tools sometimes include various parts or portions, separately cut or ground because of its size; however, such a process resulted in longer production time and costs (column 1, lines 20 – 30). To reduce the costs incurred with such a process, Manuel, et al. teach a laser cutting apparatus, in which a three-dimensional model of the tool is generated (column 5, lines 12 – 15). The three-dimensional model is then, partitioned by the processor, into distinct layers or portions (column 5, lines 20 – 25).

Each partition corresponds to a unique cross-section of the tool (column 5, lines 32 – 35). To fabricate the tool, a material is transported to the laser cutter, wherein the processor creates the cutting program to cut the material to the physical contours of the cross-section of the tool (column 5, lines 40 – 45). Once one partition has been formed, another piece of material is transported to the laser cutter to be cut to the dimensions and contours of another cross-section of the tool. Subsequently, the tool parts are then bonded (column 7, lines 1 – 10). The process is repeated and controlled by the processor until the entire tool has been fabricated. Thus, Manuel, et al. teach a controller which is capable of generating a tool design and partitioning the tool design into distinct cross-sections which are subsequently bonded to form the final tool product.

In addition, though Manuel, et al. may not teach that the tool design comprises joint components, receiving areas, holes or tongues such that these elements are used to couple together sections of the tools, such areas are obvious variations and dependent upon the actual tool being fabricated, and its design and components.

Thus, the primary reference of Heugel teaches an SLS system to fabricate multiple three-dimensional parts, concurrently, though Heugel does not teach that the parts being fabricated are joined together into one tool product, such that the controller is generating signals to fabricate the tool from multiple parts. Similarly, Manuel, et al. teach the fabrication of a large three-dimensional tool via laser cutting, in which a three-dimensional model of the tool is generated (like that in rapid-prototyping or SLS apparatus) and each tool cross-section, generated by the controller, is cut via the laser cutter. Tool partitions are subsequently bonded and thus, form the finished tool.

Therefore, because both Heugel and Manuel, et al. teach similar alternative manufacturing methods wherein the fabrication of a tool or tools occurs via the generation of a three-dimensional model and a laser device to shape the bulk material into the tool, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Heugel with the controller of Manuel, et al. for the purpose of fabricating a large tool efficiently while minimizing costs.

Claims 7 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heugel in view of Manuel, et al. and further in view of Masters (U.S. 5,216,616). Heugel and Manuel, et al. teach the characteristics previously described but do not teach that the tool is comprised of a heat sink positioned within said tool chamber or a buffer feature protecting said joint component.

In a rapid prototyping apparatus, Masters teaches the presence of a heat sink or buffer feature in the form of supports which are formed within the build chamber to prevent shrinkage or warpage during curing (column 2, lines 22 – 27; column 6, lines 8 – 35). The supports are easily melted away after the object has been formed (column 6, lines 26 – 30).

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Heugel with the controller of Manuel, et al., further configured with the supports of Masters for the purpose of reducing shrinkage or warpage during curing of the three-dimensional object.

Response to Arguments

14. Applicant's arguments filed June 30, 2008 have been fully considered but they are not persuasive. Applicant argued that the combination of references, wherein the Examiner cites Heugel in view of Manuel, et al. was improper and also argued that the primary reference of Heugel fails to teach any controller generating signals.

With respect to the reference of Heugel, the Examiner contends that a controller is inherently present. It is well known to one of ordinary skill in the art of rapid prototyping that a computer or processor is used to generate and store an object design (typically via CAD) and a controller is used to relay the object design to the system components such that each cross-section is shaped accordingly. In the apparatus of Heugel, two build chambers are used such that multiple parts can be sintered simultaneously.

Similarly, Manuel, et al. teach a system wherein a computer or processor, generates a tool design. The tool design includes an irregular cross-section with a channel and a slot. Even though the system of Manuel, et al. is not for laser sintering but for laser cutting, the systems are analogous because each endeavors to shape a bulk material, layerwise regardless of whether the material is a powder, resin or metal sheet. Both also implement a processor or computer which stores the object design. Thus, the Examiner contends that even though the systems may incorporate dissimilar materials, the control system is analogous and similar – both use computers to create and store the object design, of which such design elements are relayed by a control system to the system components to shape the material in a layerwise fashion.

Furthermore, though Applicant argues that Manuel, et al. fails to teach the specific joint features of the tool design, the Examiner still contends that it would have been obvious to modify the tool design with such features depending on the tool being manufactured. The computer or processor of Manuel, et al. is fully capable of storing varying and multiple tool designs, which can then be fabricated via rapid prototyping. Manuel, et al. even states that the three-dimensional model includes data which specifies the surface features and contours of the object to be created (column 4, lines 1 – 5). Thus, one of ordinary skill in the art of rapid prototyping is fully aware that tool designs may incorporate holes and/or tongues.

Therefore, because Heugel and Manuel, et al. teach the fabrication of objects via rapid prototyping or layered object manufacturing (LOM), it would have been obvious to modify the apparatus of Heugel with the controller of Manuel, et al. to bond the individual cross-sections together.

In addition, Applicant argues that the combination of Heugel in view of Manuel, et al. and further in view of Masters fails to teach a heat sink or equivalent. The Examiner disagrees. Masters teach the use of webs or support materials which contact the object at strategic points to limit its warpage. The webs or support materials acts as the buffer as claimed by Applicant. Therefore, the rejection of claims 7 – 8 as obvious over Heugel in view of Manuel, et al. and further in view of Masters is maintained.

Conclusion

15. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA VERONICA D. EWALD whose telephone number is (571)272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yogendra N Gupta/
Supervisory Patent Examiner, Art Unit 1791

MVE